element TSLRIC rates." DOJ Comments at 27. Similarly, "Sprint also believes it is appropriate to add, to TSLRIC costs, a reasonable amount of contribution to shared costs . . . (that is, joint and common costs)." Sprint Comments at 45. Even AT&T does not deny a shortfall and admits that there may be "cases of non-trivial 'common' or 'shared' costs." AT&T Comments at 62-63.

There is also little disagreement that these forward-looking joint and common costs must be recovered in order for TSLRIC to be efficient and non-confiscatory. See Speech of Reed Hundt, at 6 ("One other point should be clearly stated -- in adhering to the strictures of Section 251 incumbent LECs must, at the very minimum, be permitted to charge for forward looking joint and common costs"). DOJ, in arguing for an otherwise impermissibly restrictive pricing rule, nonetheless agrees that interconnection and network element charges should include "TSLRIC and the forward-looking joint and common costs." DOJ Comments at 32 (emphasis added). Sprint supports a 15% mark-up over TSLRIC to capture joint and common costs of a service or service element. Sprint Comments at 48-49. Although Sprint substantially understates the required increase, the principle is clear: a mark-up over TSLRIC is essential for the ILECs to capture even their forward-looking economic costs of providing network elements.

Those parties claiming that the joint and common costs not captured in TSLRIC should not be recovered offer no principled reason, but merely assert that the costs are small. See, e.g., MCI Comments at 66-67; AT&T Comments at 62. The size of the shortfalls is not the issue, however. That will have to be calculated on a company-by-company basis. Sound economics, sensible regulatory policy, and settled law require that the LECs recover these costs.

Several commenters nonetheless claim that the Commission should at least prevent the ILECs from recovering the "overhead" component of common costs. This argument is similarly

without legal or economic merit ILECs must recover a portion of overhead from interconnection and unbundled elements, just as (to stay in business) AT&T and MCI have to recover overhead costs from their services. No principled argument can be marshalled against such recovery. There are only unsubstantiated (and incorrect) conjectures that such costs are small. AT&T Comments at 65; MCI Comments at 66.

### 2. TSLRIC must be based on an existing network, not some fictitious "best available" network that does not and never will exist

There is a critical difference between forward looking costs based on (1) the efficient operation of an existing network, and (2) the operation of the most efficient possible network. USTA does not dispute that the forward-looking-cost portion of prices should be based on an assumption of efficient operation. But that must be efficient operation of existing, not fictitious or hypothetical, networks as urged in several comments. See, e.g., AT&T Comments at 57-59; MCI Comments at 67; DOJ Comments at 27.[30]

For reasons of efficiency and just compensation, actual networks must be the basis for TSLRIC measures. ILECs must cover the costs of the elements they own, not the ones they could hypothetically build if starting from a "blank slate" or the Hatfield model's (well-fertilized) "green field." To constrain the ILECs to recouping only the minimum costs of today's "most efficient available" networks is to confiscate their indisputably justified investments in existing basic network elements and configurations. Given that unit network costs are continually decreasing, pricing on a "green field" basis would guarantee that rates never recover costs. Such

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[30]This issue should not be confused with the question of embedded costs, infra, pp.24-26. It is purely an issue of whether the basis for forward looking costs should be existing or fictitious networks.

a principle would set up a moving target that by definition would always lead to a shortfall. It would place all investment risk on the ILEC, and confer a free option upon entrants always to demand the price of the most optimal possible network. Hausman Reply Aff. ¶¶ 3-5. If the ILEC does not have that network in place, it loses because it must nonetheless offer the lower, optimal-network price.

Basing TSLRIC on an optimal current network would be equivalent to forcing a taxi company to lease cabs with full tanks to competitors, but only allowing it to charge for fuel based on what the most efficient car available today would consume, regardless of when the fleet was actually purchased and what it actually consumes. That is a naked gift of competitive advantage to the entrants, and a naked taking from the incumbent.

Basing TSLRIC on fictitious networks would not only be confiscatory, but also an exercise in guesswork and inefficiency. Even fully competitive markets often lag behind the latest technology, but one can at least be confident that the equilibrium timing and amount of investment is socially efficient. No such assurance exists when regulators (1) decide what the optimal network technology is and (2) what prices should be based on which technologies, when no such ideal networks in fact exist. As Robert Crandall has pointed out, once the door is open to hypothetical networks, regulators must purport to know better than the market what is efficient and must choose between myriad engineering assumptions none of which will have anything to do with real costs. Comments of Bell Atlantic, Affidavit of Robert W. Crandall at ¶¶ 15-16.

Limiting costs to those of some idealized network would also create perverse incentives for investment and consumption. On its face, basing TSLRIC on optimal networks means that every time an innovation of design or technology occurs, the prices ILECs can charge drop, even

if the ILECs are still stuck with the old network. ILECs will therefore hesitate to make investments out of fear they will be unable to recover them as technology advances. ILECs will have no incentive to invest in new technology.

At the same time, competitors will overconsume elements of existing networks, shifting costs onto ILECs and never having incentives either to purchase in optimal amounts given existing networks or to build their own networks. The proper rule is that competitors should either pay prices based on existing networks or, if there is a superior option under existing technology, build their own facilities. The contrary policy advocated in several comments would indisputably deter facilities-based competition.

**3. Embedded costs must be recovered**

Even after accounting for all the long-run forward looking costs (including joint and common costs) of existing networks, there will still be unrecovered embedded costs to be recouped. These unrecovered embedded costs of investment in the LECs' networks are real costs that the LECs must bear. If they cannot recover such costs through interconnection and network element pricing, they are being forced to confer the benefits of their networks on competitors at a loss. This is not only unconstitutional, see infra, pp. 33-35, but also bad economics from the standpoint of productive efficiency.[31] ILECs will have a reduced incentive to invest in upgrading and maintaining their networks to offset the shortfall of revenues against total costs and to avoid the risk of again being unable to recover embedded costs. Hausman Aff. ¶ 11. Their investment decisions will be critically affected by the fact that returns will have to be more sharply

[31]The bad economics is exacerbated by the fact that the ILECs were not permitted to depreciate vintage capital as quickly as market conditions and technological change warranted.

discounted to reflect the price reductions that will occur with the next cost-reducing technological innovation. Hausman Reply Aff. ¶¶ 6-9. Such discounting is an inevitable consequence of denying recovery of embedded costs and will lead to suboptimal future investment in LEC networks.

The commenters that urge nonrecovery of embedded costs ignore the productive efficiency consequences of such a policy and resort to insupportable conjecture to bolster their arguments that the ILECs should not recover embedded costs. AT&T, for example, claims that "there is every reason to believe" that ILECs' network investment has been inefficient. AT&T Comments at 58. AT&T may think there is "every reason" for that belief, but there certainly is no evidence to support it. The best AT&T can come up with is a theoretical economic article from 1962 and a Commission NPRM noting the possible perverse incentives of rate-of-return regulation. Id. at 58 n.87. They cite not one finding and offer not one actual example of improper or inefficient investment.

In fact, there is no reason to believe that ILEC investment has been inefficient. To begin with, many ILECs have now been under price cap regulation at the federal level and in many of their states since January 1991. They accordingly have had strong incentives to cut their costs and to adopt the most efficient and cost-effective investment strategies possible.

Moreover, even those investments undertaken pursuant to rate-of-return regulation were subject to regular state and federal rate-base reviews. Indeed, in many cases -- such as implementing equal access, provisioning 800 databases, or placing facilities prior to end user needs -- the ILECs have been compelled by regulators to make substantial investments. Even where not directly compelled, ILEC investments have been closely scrutinized by the

Commission and state agencies. Those investments have had their "day in court" and cannot now be attacked post hoc in order to deprive the ILECs of due recovery of embedded costs. Crediting such attacks, especially without a careful and full hearing, would be a fundamental violation of due process. As Sprint correctly notes, "[i]t would be impossible, as a practical matter, for this Commission or the states to attempt to determine, after the fact, how much of an ILEC's costs have been prudently incurred." Sprint Comments at 60. Given the history of state and federal cost review, ILECs should not be second-guessed on, and deprived of recovering, their hitherto unrecovered embedded costs.[32]

It is no answer to contend, as many commenters do, that write-offs of embedded costs are often required by the competitive market. If entrants want to build their own competing facilities and thereby force the ILECs to write off embedded costs, they are free to do so. But when regulators force such losses, they, not competitive forces, are responsible. In fact, in so acting, the regulators free competitors from bearing the real costs of the incumbents' networks. This will encourage entry through assembly of "virtual networks," TRA Comments at iii-iv, instead of on a facilities basis. Such a policy discourages genuine, facilities-based competition.

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[32]MCI contends that ILECs have inefficiently invested in "overbuilt plant" through excess capacity in loops, switches, and buildings. MCI Comments at 73-74. Again, there is no incentive under price caps to incur excess capacity, and ILEC capacity investments under rate-of-return were subject to state and federal review. Indeed, MCI itself appears to recognize that technological change, not imprudence by the ILECs, is responsible for the alleged excess capacity that exists. Id. at 74 (referring to plant "no longer needed because efficient provision of telephone service requires fewer and smaller wire centers"). USTA agrees that embedded costs due to competitive lines of business should not be recovered through interconnection or network element charges, but those costs are only a tiny fraction of those attributable to the ILECs' regulated local exchange business.

### 4. Any pricing formula based on TSLRIC can be at most a guideline, not an actual rate level

Negotiation subject to state oversight is the mechanism for setting prices established by the Act. Negotiation from a baseline of TSLRIC plus joint and common costs is more efficient than regulatory rate-setting because parties inherently have a better understanding of the dictates of the marketplace and the costs of doing business than regulators do. Arbitration supplies an effective backstop.

It would be an administrative nightmare -- indeed an impossibility -- for the Commission itself to attempt to calculate reasonable TSLRICs for network elements.[33] As MFS points out "the cost study process has proven in practice to be unmanageable . . . . The Commission should eschew trying to regulate prices directly, and instead should adopt structural requirements that will enable market forces to set the prices for these elements." MFS Comments at iv. This recommendation comes from an already strong competitor to the ILECs on both a facilities and resale basis. Sprint also notes the extreme difficulty of allocating costs for a TSLRIC cost study: "'Allocat[ing] costs is not a matter for the slide-rule. It involves judgement on a myriad of facts. It has no claim to an exact science.'" Sprint Comments at 48-49 (quoting Colorado Interstate Gas Co. v. Federal Power Comm'n, 324 U.S. 481, 489 (1945)).

The contrary view of AT&T that calculating TSLRICs is "administratively manageable" (AT&T at 49) is simply not credible. See MFS Comments at 54. It is true that the concept of TSLRIC is often used by regulators, but AT&T cannot cite one single example of an actual TSLRIC level being established by an agency. In fact, the examples cited by AT&T in footnote

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[33]This is particularly true given how widely depreciation policies have varied from state to state.

69 of its comments support precisely what USTA is arguing for here: voluntary negotiations under general standards, backed by arbitration and agency review. As AT&T itself says, its examples show that under a TSLRIC standard "arbitrations . . . have proved a commonplace and effective means of settling pricing disputes that the parties have been unable to resolve through voluntary negotiations." AT&T Comments at 49 n.69. Not one example offered by AT&T involves an agency's pre-setting of an actual TSLRIC rate level. By AT&T's own examples then, TSLRIC is appropriately part of a set of pricing guidelines rather than a quantity that the Commission should actually engage in the laborious (and historically unsuccessful) task of calculating for every network element or service.

AT&T's and MCI's assertion that the Hatfield model proves the viability of TSLRIC measurement is wrong. The Hatfield model is a hypothetical construct that bears no relation to the forward-looking cost structure of an actual telephone network. The model substitutes engineering assumptions for actual cost measurement, and thereby avoids the single most difficult issue the Commission would have to face if it were to try to calculate TSLRICs. The Commission, unlike Hatfield, may not permissibly ignore actual networks for a completely fictitious "optimal" or "best available" one. It would have to do what the Hatfield model has not done -- measure actual costs of existing networks, and those costs are likely to vary widely from network to network.

### 5. Existing access charges provide appropriate proxies for some unbundled elements

Given the exceptional difficulties in measuring costs by any formula, the Commission should strongly consider adopting pricing proxies based on current access charges. Such proxies are important to all LECs, but are especially important for rural LECs and small and mid-size

LECs subject to the 2% waiver process, who should not be subjected to the burden of producing expensive and time-consuming cost studies.

Switched access charges are a proxy for transport and termination (discussed below), not for unbundled elements. But there are a number of access tariffs that do correspond to unbundled elements. For example, certain special access tariffs correspond to local loops and to other dedicated, non-switched facilities. These rates are already cost-based and do not contain the CCLC and RIC. For unbundled elements that do not have counterparts in existing access tariffs, such as signaling databases, the Commission can look to existing state and federal tariffs or to already-negotiated agreements. USTA stresses, however, that any such proxies can only serve as elements of a presumptive framework. The parties and the states must be permitted, pursuant to negotiations and subject to arbitration, to depart from those rates based on individual circumstances that will vary widely from company to company, and even within companies.[34]

**B. Transport and Termination**

Section 252(d)(2) requires arrangements for transport and termination of telecommunications to provide reciprocal compensation based on "additional costs." Many comments flatly ignore both this requirement and the fact that the statute bars regulatory imposition of bill and keep. Even if one incorrectly reads Section 252(d)(2)(B)(i) to allow bill and keep when obligations offset, it would take an impermissible cost proceeding, § 252(d)(2)(B)(ii), to determine the existence of true, reciprocal offsets. And if obligations do

[34]As the PUC of Maine notes (Comments at 19), "monthly cost of a loop may vary from under $5 to over $200 a month and . . . switching and transport costs could vary between areas by factors as great as ten to one."

not exactly offset, then only upon election of the parties may reciprocal compensation be dispensed with and bill and keep voluntarily adopted. § 252(d)(2)(B)(i).

It is therefore baffling that many commenters cavalierly call for bill and keep as an interim, or in DOJ's case even permanent (DOJ Comments at 34), policy. The policy is barred by the text, confiscatory and, as discussed in the Affidavit of Jerry Hausman accompanying USTA's opening comments (¶¶ 19-20), economically inefficient.[35] If the Commission wants an administratively simple, cost-based way to measure charges for transport and termination of traffic, it should simply adopt current access charges. Once the CCLC and the RIC are removed (which they can be for local competitors, as long as IXCs continue to pay them pending access charge/universal service reform), such charges accurately reflect the costs of terminating local calls. They are an excellent, ready-made proxy for ILEC costs.[36]

### C. Resale

Section 252(d)(3) provides that wholesale rates shall be determined based on retail rates less avoided costs. As USTA argued in its Comments (at 73-74), net avoided costs is the only efficient and proper standard for wholesale pricing. It is also the standard compelled by the

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[35]The Department rather blandly notes that "[w]hen the incremental cost of terminating traffic is zero, then bill and keep is equivalent to rates based on incremental cost." DOJ Comments at 34. But the incremental cost is never zero; even off-peak, there is always some cost. Thus, when traffic is not perfectly balanced, bill and keep is both inefficient and equivalent to a taking.

[36]Sprint would systematically ensure ILEC underrecovery by permitting CLECs to charge more for transport and termination than ILECs without any cost justification for the higher termination rate. Sprint Comments at 83-84. That is obviously unjustified. CLECs would receive a great advantage even from symmetrical rates, insofar as they will enjoy the full benefits of the greater network externalities created by the ILECs' larger networks. The least they can do is bear the actual costs of transport and termination on those networks, while recovering no more than their own costs in return.

language of the Act. AT&T is flatly wrong in suggesting that the statute does not permit offsets for costs incurred in providing services at wholesale. AT&T Comments at 83 n.128. To the extent that "marketing, billing, collection, and other costs" will be incurred by the ILEC in providing a service at wholesale, rather than at retail, such costs are not "avoided." § 252(d)(3). As a matter of economic efficiency, too, such costs must be reflected in wholesale rates. AT&T does not even dispute that. AT&T's feeble claim that resale will be affected by disputes over the amount of such offsets is baseless and obstructionist.

Several parties contend that the FCC should deem all expenses in certain USOA accounts to be avoided. But, as Bell Atlantic points out in part VIII(A) of its reply comments, many of the expenses in these accounts will not in fact be avoided. For example, account 6611 for product management expenses includes the costs of forecasting demand for, and developing, new services. Such costs will not be avoided just because some of the demand to be forecast is wholesale rather than retail. Similarly, the costs of IXC billing and order processing included in account 6623 not only will not be avoided, but will in fact increase. So there is simply no basis for declaring all account 6623 costs to be "avoided." The suggestion that account 6613, product advertising, will be avoided is similarly false. Advertising costs are not tied to specific increments of service sold at retail, and such costs will therefore not be "avoided" within the plain meaning of the Act. AT&T's distinction between "shed" and "avoided" costs (AT&T Comments at 84 n.129), has no basis in the statute. Because of the varieties of expenses encompassed within individual USOA cost categories, the avoided-cost standard cannot be implemented through a general rule disallowing recovery of entire USOA accounts.

USTA also wishes to emphasize that if ILECs are required to make below-cost services available at wholesale, they must at least continue to receive contribution for those services in the form of SLC, access charges, and universal service support. The ILECs must not be left to make up this shortfall themselves during some "interim" period pending universal-services reform. The same principle applies here as applies with regard to access-charge reform: competition and implicitly subsidized services cannot co-exist. Reform and full competition must occur simultaneously. Any transitional policy cannot be consistent with just compensation and efficiency if it places the costs on the backs of the ILECS.

Similarly, the "imputation rule" upon which the Commission seeks comment (NPRM at ¶¶ 184-187), is contrary to the Act, inefficient and confiscatory. Because some retail services are sold below cost, restricting the sum of unbundled-element prices to retail rates would force ILECs to sell those elements at a loss. It would therefore be especially inefficient and confiscatory to combine an imputation requirement with permission to bypass the resale provisions through assembly of unbundled network elements. The purpose of the Act is to promote facilities-based competition; resale is designed to hasten the transition to such competition. The imputation rule at issue here, however, would actually discourage new entrants from building their own networks, because they can rely on below-cost virtual networks.

Several comments argue against exempting special promotions from the resale provisions. Disallowing such an exception would be contrary to the Act's goal of competition. If the ILECs cannot lower prices promotionally without offering a deeper discount off those prices to resellers, then there will never be any incentive for ILECs aggressively to take the lead in competition. Moreover, they will be unable to make special offers even to meet competition by a reseller that

itself undertakes a promotion. A special offer that merely meets competition would simultaneously force the ILEC to give a lower wholesale price to that very competitor if the suggestions made by AT&T, DOJ, and others on this point are adopted. As a result, resellers could cause their own input prices to decline simply by reducing their output prices. Failure to allow a special-promotions exemption will effectively take the ILECs off the front lines of competition in a variety of retail markets.

**D. Takings**

Even leaving aside embedded costs, which as shown must themselves be recovered, the various pricing proposals made by the IXCs and DOJ would force the ILECs to operate at a deficit. The ILECs would (1) be unable to recover even the forward looking costs of their actual networks; (2) be forced to meet regulatory requirements of below-cost service without receiving contributions from IXCs, who would purchase unbundled access at below-cost rates; (3) receive no compensation for traffic they transport and terminate on their network for other carriers; and (4) be forced to establish wholesale rates for below-cost services that don't even reflect the costs of providing those services at wholesale. The ILECs could not even recoup day to day costs through such a scheme, much less their very real overhead and embedded cost burdens.[37]

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[37]That competition may one day force prices to an idealized TSLRIC is beside the point. Regulation and competition are legally distinct. When prices are reduced to incremental cost by competition, and a "write down" of embedded costs ensues, it is called a business loss and is a risk of trade. When, in contrast, a loss of embedded investment and even of day-to-day incremental revenue requirements is mandated by regulation, it is called an unconstitutional taking. AT&T's write-down in the wake of divestiture is an example of the former, not the latter. AT&T Comments at 71 n.105. Indeed, it should be noted that AT&T's write-down was applied to its "financial books," not its "regulatory books." AT&T did not seek to reduce its regulated prices, nor was it required to reduce prices to reflect the write-down and, as a result, AT&T continued to enjoy the opportunity to recover its analog plant investment from customers.

It is indisputable that such radical proposals would put all investment risk on the ILECs while guaranteeing the benefits of an idealized, though never realized technology to the ILECs' competitors who invest nothing. Such a rule would make it all but impossible for the ILECs to attract capital investment.

As explained in USTA's Comments, rate regulations that prevent LECs from recovering their costs are confiscatory, and as such are subject to scrutiny under the Takings Clause. See Duquesne Light Co. v. Barasch, 488 U.S. 299, 308-10 (1989); FPC v. Hope Natural Gas Co., 320 U.S. 591, 602 (1944). Restricting LECs to charging rates that cannot generate revenues sufficient to cover total costs will force them to use their resources to supply competitors without just compensation. Furthermore, prices constrained to TSLRIC and that fail to account for joint, common and embedded costs would interfere with the expectations on which LECs have based past investment decisions that have been reviewed by state and federal authorities. For the Commission to decide now, long after those costs have been sunk, to bar compensatory returns would violate due process and undermine the LECs' legitimate, investment-backed expectations. Interference with property rights in a manner that undermines such expectations constitutes a taking. Penn Central Transp. Co. v. New York City, 438 U.S. 104, 124 (1978).

Illinois Bell Tel. Co. v. FCC, 988 F.2d 1254 (D.C. Cir. 1993), upon which AT&T relies (at 70 n.103), does not stand for the proposition that costs may be disallowed at will without violating the Takings Clause. What it says is that in the regular course of rate-making proceedings some investments may be discounted by the FCC's "used and useful" standard of 47 CFR § 65.800, and that such failure to compensate is not confiscatory. Id. at 1263. The decision hinged in large part on the fact that the FCC's standard was publicly known and was adjusted for

by the market in its investment decision. That opinion has no bearing here, where a fundamental shift in regulation would occur through complete disallowance of embedded costs, of overhead, and absurdly, even of the incremental costs of operating existing networks (as opposed to fictitious ones conjured up by engineers on the IXCs' payrolls).

Opposing comments also ignore the fact that there is an administrative law issue that precedes the substantive takings analysis. As we have already argued, it is settled law that, "[w]ithin the bounds of fair interpretation, statutes will be construed to defeat administrative orders that raise substantial constitutional questions." Bell Atlantic Tel. Cos. v. FCC, 24 F.3d 1441, 1445 (D.C. Cir. 1994); see also Rust v. Sullivan, 500 U.S. 173, 190-91 (1991). There is no warrant to take property in the 1996 Act. On the contrary, the Act expressly provides that ILECs must be allowed to set prices that recover their costs. If the Commission adopts the extreme suggestions of the IXCs and like-minded parties, its regulations would be invalid under established D.C. Circuit precedent even before a finding is made that an uncompensated taking has occurred. As much as interested parties wish to make their proposals unfettered by such constitutional constraints, the Commission is not at liberty to do so.

## V. EXEMPTIONS, SUSPENSIONS AND MODIFICATIONS

USTA has asked the Commission to issue general guidelines to ensure that the states implement Section 251(f) in a manner consistent with one another and with Congress's stated desire to protect smaller LECs from undue economic and technical burdens as a result of the Act's interconnection requirements. Two principles must guide the Commission in setting those ground rules. With respect to small/mid-sized LECs with fewer than 2% of the nation's subscriber lines, the Commission must promulgate guidelines to ensure that these companies

recover their total costs in providing interconnection and unbundled elements. Full cost recovery is essential to enable small/mid-sized LECs to compete with the larger companies that generate those costs. With respect to rural LECs, the Commission must issue guidelines to ensure the "bona fides" of any interconnection request. If the rural LEC exemption means anything, it means that states may not terminate an exemption upon a vague, tentative, or unsubstantiated request for interconnection or one that makes no provision for the recovery of costs.

USTA has proposed specific guidelines, which we will not restate here. See USTA Comments 87-88, 91-92. Several ILECs have proposed additional guidelines consistent with these principles and which USTA supports.[38] Other commenters, such as AT&T and NCTA, however, propose guidelines fundamentally at odds with the text and goals of Section 251(f).

AT&T, for example, has asked the Commission to require that a petitioning LEC demonstrate that the requirements of the Act would "inflict substantial harm on the LEC and its customers in its territories that would not be inflicted on larger LECs and customers in their territories" and that a state commission "narrowly tailor" any suspension or modification "to address the particular harm that the state may find." AT&T Comments at 92-93. But Section 251(f)(2) imposes no such requirements. Rather, it provides that a state commission "shall" approve a petition "to the extent that, and for such duration as," suspension or modification is necessary to avoid "a significant adverse economic impact on users of telecommunications services generally," or to avoid "imposing a requirement that is unduly economically burdensome" or "technically infeasible." Thus, the statute contains its own substantive standards,

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[38]See, e.g., Southern New England Telephone Company Comments at 35-37; Lincoln Telephone and Telegraph Company Comments at 22-25; Cincinnati Bell Telephone Company Comments at 7-9, 42.

which are LEC-specific and less stringent than AT&T's wishful-thinking "substantial harm" standard. In addition, Section 251(f)(2) establishes its own flexible tailoring requirement, which permits the states important leeway in fashioning suspensions or modifications to suit the specific circumstances of particular small or mid-size LECs. Although the Commission has authority to issue general guidelines to ensure consistent application of the substantive requirements of Section 251(f)(2), it has no authority to override the basic standards that Congress enacted.

The National Cable Television Association ("NCTA") argues that a carrier may only petition for relief from the requirements of Section 251(b) and (c) that apply to "telephone exchange facilities" and invites the Commission to define which requirements qualify. See NCTA Comments at 63-67. But NCTA simply misreads Section 251(f)(2), which provides that a qualifying LEC may petition "for suspension or modification of the application of a requirement or requirements of subsection (b) or (c) to the telephone exchange service facilities specified in such petition." The phrase "telephone exchange service facilities" does not describe the type of requirement for which suspension or modification is available. Rather, it refers to the facilities to which the requirements of Section 251(b) and (c) otherwise would apply and for which suspension or modification consequently is sought -- that is, the facilities of the petitioning LEC.[39]

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[39]NCTA also encourages the Commission to make clear that suspensions or modifications that would frustrate the Act's objectives of promoting competitive choice for telecommunications and encouraging new entry are presumptively invalid under the "public interest" prong of Section 251(f)(2). But a presumption against any suspension or modification that delayed full competition would be inconsistent with the Act. As we have said, in enacting Section 251(f)(2), Congress recognized that small and medium-sized LECs can effectively compete for subscribers provided they are given a reasonable period in which to adapt to the competitive marketplace. Thus, Congress contemplated that a certain amount of delay was necessary -- indeed, in the public interest -- to enable smaller LECs to adjust to competition without negatively affecting their customers.

With respect to Section 251(f)(1), NCTA agrees with USTA that the Commission should provide guidance to the states on what constitutes a "bona fide request for interconnection, services, or network elements." NCTA asks the Commission to make clear that the term "bona fide request" does not permit rural LECs or state commissions to impose burdensome "pre-filing" requirements on requesting telecommunications carriers as a condition to state review. USTA has suggested no burdensome "pre-filing" requirements. To the contrary, USTA has asked the Commission to impose only modest requirements to ensure the "bona fides" of the interconnection request -- that is, that the requesting carrier is acting in earnest and that rural LECs will be able to recoup the costs of providing interconnection. USTA Comments at 87.

It is imperative that the Commission establish guidelines to ensure that the states consistently administer Section 251(f) with an eye toward accommodating the particular concerns of smaller LECs. But the Commission should resist any invitation to narrowly construe Section 251(f) or otherwise dilute its protections in the guise of general guidelines. As we said in our initial comments, Section 251(f) was well thought out and thoroughly considered. While it is plainly within the Commission's power to set guidelines for applying Congress's judgment with respect to smaller LECs, the Commission may not second-guess that judgment.[40]

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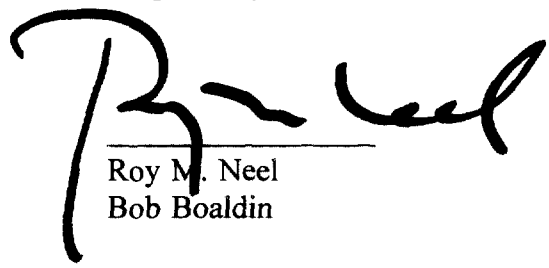
[40]The Commission is also precluded from requiring ILECs to make available to CLECs, pursuant to Section 252(i), their interconnection agreement with neighboring incumbent LECs. As an initial matter, almost all such agreements predated the 1996 Act and were not therefore "approved under [Section 252]." Moreover, as we demonstrated in our opening comments, the context and legislative history of this provision clearly indicate that Congress only intended to reach agreements between competing LECs. See USTA Comments at 68 n.61. Commenters urge the Commission to disregard these strong indications of congressional intent simply because neighboring LECS might one day compete with each other. If neighboring LECs choose to compete with each other, they will be required to comply with the terms of sections 251 and 252 at that time. Until then, Congress's intent is unmistakeably clear: non-competing neighboring LECs and their existing interconnection agreements are exempt from those provisions.

Respectfully submitted.



Roy M. Neel
Bob Boaldin

United States Telephone Association
1401 H Street, N.W., Suite 600
Washington, D.C. 20005
(202) 326-7247

Mary McDermott
Linda Kent
Charles D. Cosson
Keith Townsend
Its Attorneys

May 30, 1996

**BEFORE THE**
**FEDERAL COMMUNICATIONS COMMISSION**

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| In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996 | ) ) ) | CC Docket No. 96-98 |

Reply Affidavit of Professor Jerry A. Hausman

1. In my previous affidavit in this proceeding I explained that purely forward-looking TSLRIC should not be the price for interconnection elements for two reasons: (1) it ignores fixed and common costs, and (2) telecommunications networks are mostly sunk costs. The Comments of the Department of Justice (DOJ) recognized the first problem and stated that a markup over TSLRIC could be needed (pp. 31-32). Dr. Carl Shapiro, at the time the chief economist at DOJ, commented on the problem of sunk costs at the FCC economics forum on May 20, 1996. The DOJ's submission, however does not address sunk costs. The modern economic theory of investment places a high degree of emphasis on sunk and irreversible investments. I explain here why TSLRIC does not provide the correct pricing rule when sunk investments are present under uncertain demand and price situations. A TSLRIC calculation which ignores sunk costs for networks is systematically downward biased by a factor of at least 2, and the factor probably exceeds 3.

2. The NPRM notes that with technological advance the use of forward looking TSLRIC will cause the ILEC not to recover its investment (¶ 144).[1] At the FCC forum on May 20, Dr. Shapiro also raised the issue of depreciation. Investment and depreciation issues can be both treated more broadly by using modern economic techniques, developed over the past 10 years, which analyze the investment decision when the investment is irreversible and sunk. MacDonald and Siegel (1986) were the first to apply modern options pricing theory to this class of problems. A number of Ph.D. theses and articles in economics journals, e.g. Ingersoll and Ross (1992), have followed this approach, and a clear textbook treatment is given in Dixit and Pindyck (1994).

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[1] The DOJ submission claims that TSLRIC is correct because "competition would drive prices to forward-looking costs" (p. 29). Suppose, however, the price of a capital investment is decreasing at 10% per year due to technological progress. A competitive firm must build this price decrease into its cost of capital or it will never recover its cost of investment. TSLRIC does <u>not</u> include this price decrease, so that the DOJ is assuming that competitive firms act irrationally. Increases in depreciation allowances may provide an "accounting fixup" to the incorrect TSLRIC calculation, but TSLRIC does not explicitly take price decreases of the capital goods into account.

A. The Economic Effect of Sunk and Irreversible Investments Under Uncertainty

3. Even AT&T recognizes the "enormous sunk costs to replicate network facilities." (AT&T Comments p.75.) The importance of taking into account the sunk and irreversible nature of an investment arises for a number of reasons. To begin, if sufficient future demand does not exist for the product or service, the capital cannot be used for alternative production. This "asset specificity" is the essential nature of a sunk cost and accurately describes ILEC networks. In the absence of competition, demand uncertainty was not of particular importance because of rate of return regulation and the growing demand for most ILEC telecommunications services. However, with the advent of competition under the 1996 Act an entrant is expected initially to buy some network elements from an ILEC to be used in conjunction with its own facilities, and then to decide whether to construct all of its own facilities. The entrant does not commit to use an ILEC's new investment over the economic life of that investment, which a TSLRIC calculation assumes will happen. Thus, demand need not continue to grow for an ILEC overall or for specific network elements, and it could actually decline in the future due to competition and technology. Other economic factors which arise with uncertainty over price, technological change, and interest rates also affect efficient investment with sunk costs, as I will explain below.

4. TSLRIC calculations thus give the new entrant an option, but not the commitment, to use an ILEC's network in the future. Options are very valuable and their value typically increases with lifespan. Here, the options are for the economic lifetime of the network investments--often 10-20 years. A TSLRIC based calculation gives the option for free to the new entrant and forces the ILEC to bear the cost of the option. The CLEC will get all the good outcomes (by exercising the option) while the ILECs will take all of the risk even assuming recovery of joint and common costs and that inadequate past depreciation problems have been eliminated. Under TSLRIC based prices, ILECs will lose money when technology improves or demand decreases, but will receive no reward for bearing this risk. And the CLEC receives for free the option to use the network investment at cost under TSLRIC based prices. This asymmetrical outcome causes

TSLRIC to give badly biased results because it does not account for the uncertainty inherent in investment decisions by the ILECs. The systematic bias which arises from prices based on TSLRIC in this situation will cause inefficient investment and productive inefficiency.

5. TSLRIC, as calculated in the past, assumes that all capital invested now will be used over the entire economic life of the new investment. With changing demand conditions, changing prices, or changing technology, this assumption is not necessarily true. Thus, TSLRIC assumes a world of certainty where the actual world is one of uncertainty in the future.[2] I will now show the profound effect the sunk nature of investment has on the calculation of TSLRIC. Consider the value of a project under no demand uncertainty with a risk adjusted discount rate of r and assumed known exponential economic depreciation at rate $\delta$. This assumption on depreciation can be thought of as the price of the capital decreasing over time at this rate due to technological progress. Assume that price, net of the effect of economic depreciation of the capital goods, is expected to decrease with growth rate $-\alpha$.[3] The initial price of output is P. The value of the project is:

$$V(P) = \int_0 \lambda \exp(-\lambda t)\ P\ \frac{1-\exp(-\delta t)}{\delta} dt = P/(\lambda + \delta) \qquad (1)$$

where $\lambda = r + \alpha$. Note that $\delta$ is added to expression to account for the decreasing price of capital goods. This term, omitted from a TSLRIC calculation, accounts for technological progress in equipment prices, which is one economic

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[2] AT&T's submission explicitly describes the role of uncertainty. AT&T states that a CLEC may well purchase unbundled network elements in an area and depending on the outcome decide to expand its own facilities-based operations in the future. (pp. 30-31) However, the investment that the ILEC had to make to provide the network elements purchased by the CLEC creates significant costs over the entire economic lifetime of the investment. If the CLEC walks away after say 2 years, the ILEC is left with the investment required by the CLEC's demand. Even if the ILEC is able to sell the output of the investment to another CLEC, the price may be significantly lower than two years ago because of changes in technology or market conditions. An efficient economic outcome would cause the CLEC to bear the entire cost of the investment or to pay the ILEC to bear some or all of the risk. Neither AT&T nor its consultants' submission ever takes this cost of uncertainty into account in discussing prices of network elements.

[3] This factor arises due to changes in demand and changes in total factor productivity. It can be set to zero with no change in the results.

factor that leads to lower prices over time. Suppose that the cost of the investment is I. The rule for a competitive firm is to invest if V(P) > I. Equivalently from equation (1), P > ($\lambda$ + $\delta$) I. The economic interpretation of this expression is that the price (or price minus variable cost) must exceed the cost of capital, which includes the change in price of the capital good to make the investment worthwhile. Note that the net change in the output price and the price of the capital good both enter the efficient investment rule. Proponents of a TSLRIC price for network elements are attempting to establish a single price over a long period of time. The TSLRIC calculation ignores the basic economic fact that when technological change is present, (quality adjusted) capital goods prices tend to decline over time. This economic factor needs to be taken into account or economic inefficiency will result.

6. Now, a TSLRIC calculation does not include $\delta$, but it instead assumes that the price of capital goods does not change over time. This assumption is extremely inaccurate. Take a Class 5 Central Office Switch (COS) for example. Nine years ago an AT&T Class 5 switch (5-ESS) sold to a BOC for approximately $200 per line (Hausman and Kohlberg (1989), p. 204). Today, the price of AT&T 5-ESS switches and similar NTI switches are in the $80 per line range. A TSLRIC calculation would be based on the $80 price. A BOC who paid $200 per line made the efficient investment decision when it purchased its COS. But TSLRIC, by omitting economic depreciation due to technological progress, leads to a systematically downward biased estimate of costs.[5] The omitted economic factor $\delta$ can be quite large relative to r for telecommunications switching or transmission equipment due to technological progress. Thus, the bias in TSLRIC can be significant from omitting this factor.

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[4] For simplicity, I am assuming only capital costs and no variable costs in this calculation. Variable costs can be included by reinterpreting P to be price minus variable costs which will lead to the same solution.

[5] Technological progress occurs here because as Hausman and Kohlberg (1989) describe, a modern COS combines a switch block with a computer. Indeed, the same Motorola chips which are used in Apple computers and the same Intel chips which are used in PCs provide the microprocessors in many types of COS. Given the rapid decline in the price of microprocessors due to technological progress, COS prices have also decreased.

7. In its descrip ion of TSLRIC, AT&T calls for the "most efficient technology" so that the " ess efficient" COS technology that it sold to ILECs would not be covered. At the time the ILECs bought the AT&T COS, they were widely considered to be he best technological choice, see e.g. Hausman and Kohlberg (1989). Because he switches were a sunk investment, AT&T's recommended method to set prices at TSLRIC would not allow recovery of an efficient investment in 1990 which is "not efficient" in 1996 due to technological progress. AT&T's argument that all firms face risk from changing technology (p. 71) is correct; but firms which face these risks build a risk premium into their prices. Regulation has no permitted ILECs to build in the risk premium. Indeed, improper depreciation li es set by regulation has led to too slow capital recovery even in a world f certainty.

8. I now account f r the sunk nature of the investment and uncertainty. Given the fundamental un ertainty and the sunk nature of the investment, a "reward for waiting" occu s because over time some uncertainty is resolved. The uncertainty can arise fro at least 4 factors: (1) Demand uncertainty; (2) Price uncertainty; (3) Technol gical progress (input price) uncertainty; and (4) Interest rate uncertainty Now the fundamental decision rule changes to:

$$P^S > \frac{\beta_1}{\beta_1 - 1} (\delta + \lambda) I \qquad (2)$$

where $\beta_1 > 1$ so that $m = \beta_1/(\beta_1 - 1) > 1$. The parameter $\beta_1$ takes account of the sunk cost nature of the i vestment coupled with inherent economic uncertainty.[6] Parameter m is the mark-up factor required to account for the effect of uncertain economic factors on the cost of sunk and irreversible investments. Thus, the critical cut off point fo investment is $P^S > P$ from equation (1).

9. To see how impo tant this consideration of sunk costs can be, I need to evaluate the factor m. The parameters $\beta_1$ and m depend on a number of economic

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[6] I do not derive this equation here since it is the solution to a differential equation. F r a derivation see e.g. Dixit and Pindyck (1994), pp. 254-256 pp. 279-280, and p. 369. The parameter $\beta_1$ depends on the expected risk adjusted discount rate of r, expected exponential economic depreciation $\delta$, and the net expected price -a and the amount of uncertainty.

factors. It can be demonstrated that as uncertainty increases, i.e. the variance of the underlying stochastic process, $\beta_1$ decreases and the m factor increases. Also, as $\delta$ increases, $\beta_1$ increases which means that the m factor decreases. As r increases $\beta_1$ decreases so that the m factor increases. Dixit and Pindyck (1994, p.153) calculate m = 2 so that, for instance, $V^S = 2I$.[7] A TSLRIC calculation which ignores the sunk cost feature of telecommunications network investments would thus be off by a factor of two. Using parameters for ILECs and taking account the decrease in capital prices due to technological progress (which Dixit and Pindyck assume to be zero in their calculation) I calculate the value of m to be around 3 2-3.4. Thus a TSLRIC calculation which ignores sunk costs for telecommunications networks is systematically downward biased by a factor of at least 2, and the factor probably exceeds 3.[8]

10. A TSLRIC calculation would now miss two components which would lead to a systematic downward bias: (1) price decreases in investment due to $\delta$, which represent changes in technology and (2) the sunk cost factor in telecommunications networks combined with inherent economic uncertainty. Combining these two omitted factors in a TSLRIC calculation demonstrates that the systematic downward bias can be substantial. For reasonable values of the parameters, TSLRIC can be biased downward by a factor of over 3. As an approximation, the discount rate would need to increase by the same factor to

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[7] Ingersoll and Ross (1992, p. 12) for a 20 year project, which seems about right for network investment, calculate an adjustment factor of about 2.2 times. This calculation considers only interest rate (price) uncertainty, and does not account for technological change.

[8] Thus, Sprint's proposal to use the federal rate of return in a TSLRIC calculation (p. 45) neglects the sunk cost component of the investment and would lead to badly biased results. Consider the following example. Hewlett Packard (HP) makes microprocessor which are used in work stations which it sells to its competitors who also manufacture work stations. Investment in a new microprocessor fabrication plant is very risky given increasing competition from Intel Pentium class chips. The investment is almost totally sunk. Now HP's hurdle rate is likely 2-3 times its cost of capital. Yet Sprint's proposal would force HP to supply microprocessors to it based on the cost of capital, not on the hurdle rate.